



## Oregon DEQ Division 33 Review Summary Sheet

### Application Information

<b>Applicant Name:</b>	ZORN FARMS INC.	<b>Application Number:</b>	G-18849
<b>Basin &amp; Sub-basin:</b>	Willamette Basin/Mid-Willamette Sub-basin	<b>Requested Water Amount:</b>	1.33 CFS
<b>Nearest Surface Water:</b>	Unnamed tributary to Willamette River/Mission Creek	<b>Nearest Receiving Waterbody:</b>	Unnamed tributary to Willamette River/Mission Creek
<b>Proposed Use:</b>	Irrigation	<b>Requested Period of Use:</b>	March 1 – October 31

### Division 33 Geographic Area

<input checked="" type="checkbox"/> Lower Columbia <input type="checkbox"/> Upper Columbia <input type="checkbox"/> Statewide	
<b>Upper and Lower Columbia Basins only:</b> Based upon the review completed below, does the proposed use comply with existing state and federal water quality standards or may conditions be applied to bring the use into compliance?	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Insufficient data
<b>Statewide:</b> Will the proposed use result in water quality impacts that will cause either “loss” or “net loss” of essential habitat of sensitive threatened or endangered (ST&E) fish species? (Note: the presence of ST&E fish species is determined by Oregon Department of Fish and Wildlife.)	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Insufficient data

### Recommended Pre-Proposed Final Order Actions

1.
2.
3.
<b>Mitigation Obligation</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
Prior to issuance of a Proposed Final Order, the applicant shall submit a mitigation proposal that is of no less volume and rate than the permitted use. The proposal shall include water that is sourced upstream of the point of diversion or appropriation, or the uppermost point on the stream at which the potential for surface water interference occurs. If a surface water right is used for mitigation, it shall be instream for the [ ] time period and of similar water quality. The applicant should contact their OWRD caseworker to discuss flow mitigation options.

### Recommended Permit Conditions

<b>1. Water Quality:</b> All water use under this permit shall comply with state and federal water quality laws. The permittee shall not violate any state and federal water quality standards, shall not cause pollution of any waters of the state, and shall not place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means. The use may be restricted if the quality of source stream or downstream waters decrease to the point that those waters no longer meet existing state or federal water quality standards.
<b>2. Agricultural Water Quality Management Area Rules:</b> The permittee shall comply with basin-specific Agricultural Water Quality Management Area Rules described in Oregon Administrative Rule Chapter 603-095. The permittee shall protect riparian areas, including through irrigation practices and the management of any livestock, allowing site capable vegetation to establish and grow along streams, while providing the following

functions: shade (on perennial and some intermittent streams), bank stability, and infiltration or filtration of overland runoff.	
3.	
4.	
Additional Reviewer comments <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
[Use this space to describe any of the following: reasoning to substantiate permit conditions; examples of additional information that may allow or disallow the use; and why any variations to the standard Division 33 review process were necessary. Designate conditions related to Division 310 with an asterisk.]	
Based on ODA's finding of no measurable impact on surface waters, DEQ is not requesting mitigation.	
Interagency consultation: [Describe any substantial interagency consultation. Who was contacted and what was discussed?]	
DEQ review prepared by: Sarah Sauter	Date complete: 7/27/2020

**ODA Review Request**

ODA review requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	Date review sent to ODA: 6/22/2020
ODA reviewer:	ODA review date: 7/16/2020
ODA comments <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes	
<p><b>P. Measeles:</b> Based on my review, this would have no measurable impact on surface water, and therefore would not require mitigation. The water is proposed to be sourced from an aquifer that is confined by an aquiclude more than 100 feet thick, and is not in connection with Mission Creek or the Willamette River within five miles of the well head. The well is screened 299 feet below ground surface. OWRD's hydrogeologic review describes this aquifer as being confined, with the confining layer having a hydrologic conductivity of 0.01 feet per day, or less. The review also states "no potential for surface interference."</p> <p><b>M. Matter:</b> The applicant may consider checking with OWRD regarding other options, such as whether water is available for storage during winter months.</p>	

**Antidegradation Policy:**

The purpose of DEQ's Antidegradation Policy (OAR 340-041-0004(1)) is to guide decisions that affect water quality to prevent unnecessary further degradation from new or increased point and nonpoint sources of pollution, and to protect, maintain, and enhance existing surface water quality to ensure the full protection of all existing beneficial uses. Oregon's Antidegradation Policy allows exemptions and conditions for new or increased water use.

**1. Temporary Use or Net Benefit**

Does the applicant propose a temporary use in response to an emergency, a restoration activity that the DEQ has determined provides a net ecological benefit, or a temporary (lasting less than six months) use to protect human health and welfare, for which the applicant has demonstrated that they will minimize adverse effects to threatened and endangered species?  No  Yes

If yes, recommend approval of the application and identify conditions necessary to protect water quality for the habitat of ST&E fish species. You may skip to Question 7.

**2. Outstanding Resource Water**

Does the applicant propose withdrawing directly from an **Outstanding Resource Water** with critical habitat for ST&E fish species?  No  Yes

If yes, then prior to permit issuance, the applicant must provide suitable flow mitigation. You may skip to question 7.

**3. Water Quality Limited**

Is this source **Water Quality Limited** or a tributary to a water quality limited water body? Note: limit downstream review to 6<sup>th</sup> field HUC for parameters that diminished flow can affect (temperature, dissolved oxygen, pH, etc.).  No  Yes

**Integrated Report 303(d) List Summary Table**

Water Body (Stream/Lake)	River Miles	Parameter	Season	Criteria	Beneficial Uses	Status
Mission Creek	0 to 10.6	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l		Cat 5: Water quality limited, 303(d) list, TMDL needed
Middle Willamette	Willamette River	24.8 to 54.8	Biological Criteria	Year Round	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Resident fish and aquatic life
Middle Willamette	Willamette River	54.8 to 108	Biological Criteria	Year Round	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Resident fish and aquatic life
Middle Willamette; Lower Willamette	Willamette River	0 to 50.6	Temperature	Year Round (Non-spawning)	Salmon and steelhead migration corridors: 20.0 degrees Celsius 7-day-average maximum	Salmon and steelhead migration corridor
Upper Willamette; Middle Willamette	Willamette River	50.6 to 186.5	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l	Cool-water aquatic life
Upper Willamette; Middle Willamette	Willamette River	54.8 to 186.5	Dissolved Oxygen	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Salmon and steelhead spawning

Upper Willamette; Middle Willamette	Willamette River	50.6 to 186.5	Temperature	Year Round (Non-spawning)	Salmon and trout rearing and migration: 18.0 degrees Celsius 7-day-average maximum	Salmon and trout rearing and migration
Upper Willamette; Middle Willamette	Willamette River	54.8 to 186.5	Temperature	October 15 - May 15	Salmon and steelhead spawning: 13.0 degrees Celsius 7-day-average maximum	Salmon and steelhead spawning
Middle Willamette	Champoeg Creek	0 to 7.5	Dissolved Oxygen	January 1 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Cat 5: Water quality limited, 303(d) list, TMDL needed
Middle Willamette	Champoeg Creek	0 to 7.5	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l	Cat 5: Water quality limited, 303(d) list, TMDL needed

Analysis: [If the answer to question 3 is yes, then describe how the use does or does not comply with existing state and federal water quality standards, and how the use may affect ST&E fish species habitat.]

Temperature: Oregon's stream temperature standards are based on the life cycle needs of salmonids. Stream temperatures that exceed the standards can disrupt the life cycle of a sensitive, threatened, or endangered fish species and may even cause death. Temperatures are already known to exceed standards in the Willamette River in the summer. Summertime withdrawals from the stream will reduce the stream's heat capacity and cause greater fluctuation in daytime and nighttime stream temperatures. Non-summer withdrawals will reduce floodplain recharge from high flow events, thus reducing the volume of cool water released from floodplain storage into the stream throughout the year. This will result in the diminution of habitat of sensitive, threatened, or endangered fish species.

Dissolved Oxygen: Fish and other aquatic organisms require different concentrations of dissolved oxygen based on their species and life history stage. Oregon's dissolved oxygen standards are based on the most sensitive species and life history stage at the location and season of concern. Dissolved oxygen levels are affected by temperature, flow, nutrient loading, algae growth, and other factors. If dissolved oxygen drops too low enough levels, it can result in fish kills. In waterbodies where dissolved oxygen concentrations are known to be insufficient for the habitat of sensitive, threatened, and endangered fish, any additional reduction in dissolved oxygen concentrations would result in the diminution of habitat.

Biological Criteria: Oregon's biological criteria standards are based on the assemblage of species needed to maintain a healthy resident biological community. Resident biological communities are the local food webs that support fish. Reduced flows and increased temperatures will degrade the biological community and therefore result in the diminution of habitat of sensitive, threatened, or endangered fish species.

Recommended Conditions: [Consider if water quality can be protected by limiting the rate and quantity of water used, period of use, or by including other permit conditions.] **Water Quality, Agricultural Water Quality Management Area Rules**

#### 4. Total Maximum Daily Load Summary

Are there TMDLs established for parameters identified as being affected by flow modification?  No  Yes

Analysis: [List TMDL, identify the load allocation, and if flow modification is a contributing factor. Describe how the use does or does not comply with existing state and federal water quality standards and how the use may affect ST&E fish species habitat.]

Analysis: Willamette Basin TMDL. Chapter 4: Temperature-Mainstem TMDL and Subbasin Summary; Chapter 7: Middle Willamette Subbasin TMDL

The Middle Willamette Subbasin TMDL identifies a critical season for temperature: “The critical condition for stream temperature and heat loading is the seasonal period of maximum stream temperatures and lowest stream flows. Maximum stream temperatures are a function of combining the effects of atmospheric inputs (solar radiation) and low stream flows that usually occur during the summer period. For many point sources the most critical condition for complying with the human use allowance occurs during the combined effect of low stream flow and the greatest difference between effluent and river temperatures, usually in late summer to early fall.” Pg 7-29: Willamette Basin TMDL: Middle Willamette Subbasin

The critical condition for stream temperature and heat loading is the seasonal period of maximum stream temperatures and lowest stream flows. Maximum stream temperatures are a function of combining the effects of atmospheric inputs (solar radiation) and low stream flows that usually occur during the summer period. For many point sources the most critical condition for complying with the human use allowance occurs during the combined effect of low stream flow and the greatest difference between effluent and river temperatures, usually in late summer to early fall. Pg 7-10: Willamette Basin TMDL: Middle Willamette Subbasin

Peak temperatures typically occur in mid-July through mid-August and often exceed the salmon and trout rearing and migration criterion. Temperatures are much cooler late summer through late spring but occasionally exceed the spawning criterion. Pg 7-10 Willamette Basin TMDL: Middle Willamette Subbasin

The Temperature-Mainstem TMDL for the Willamette extends from the confluence of the Coast Fork Willamette and Middle Fork Willamette Rivers, which join to form the mainstem Willamette, downstream to the Columbia River. These TMDLs include all surface waters that affect the temperatures of 303(d) listed water bodies because stream temperature is affected by heat loads from upstream as well as local sources. Water quality standards include designation of beneficial uses of water, numeric and narrative criteria for individual parameters to protect those uses, and antidegradation policies to protect overall water quality. Implementing the TMDL is intended to achieve compliance with water quality standards.

Numeric and narrative water quality criteria are applied to protect the most sensitive beneficial uses. The most sensitive beneficial uses to temperature in the Upper Willamette Subbasin are:

- Resident fish and aquatic life
- Salmonid spawning, rearing and migration
- Anadromous fish passage

Beneficial uses are considered attainable wherever feasible or wherever attained historically.

Recommended Conditions: [Consider if water quality can be protected by limiting the rate and quantity of water used, period of use, or by including other permit conditions.] **Water Quality, Agricultural Water Quality Management Area Rules**

**5. Cumulative Withdrawals Effects**

Is it likely that the proposed activity, together with existing withdrawals in the OWRD’s Water Availability Basin (WAB), will lower water quality and impair aquatic life?  No  Yes

**Water Availability Summary Table**

Percent of natural flow = (consumptive use/natural stream flow)\*100. See Appendix for detailed instructions.

[Water Availability Basin]: WILLAMETTE R > COLUMBIA R - AB MOLALLA R

Watershed ID	Exceedance Level	Month	Natural Stream Flow	Consumptive Use	Expected Stream Flow	Reserved Stream Flows	Instream Requirement	Net Water Available	Percent of Flow
182	50	JAN	38500	2300	36200	0	1500	34700	6%
182	50	FEB	37100	7480	29600	0	1500	28100	20%
182	50	MAR	32800	7260	25500	0	1500	24000	22%
182	50	APR	28300	6920	21400	0	1500	19900	24%
182	50	MAY	22200	4260	17900	0	1500	16400	19%
182	50	JUN	12500	1980	10500	0	1500	9020	16%
182	50	JUL	6330	1810	4520	0	1500	3020	29%
182	50	AUG	4290	1650	2640	0	1500	1140	38%
182	50	SEP	4420	1390	3030	0	1500	1530	31%
182	50	OCT	6690	757	5930	0	1500	4430	11%
182	50	NOV	19000	890	18100	0	1500	16600	5%
182	50	DEC	40700	973	39700	0	1500	38200	2%
182	50	ANN	15200000	2250000	13000000	0	1090000	11900000	15%

Monthly flow in Cubic Feet per Second (CFS). Annual flow in Acre Feet (AF). Highlight months that exceed 20% of percent of flow.

**Water Availability Summary Table**

Percent of natural flow = (consumptive use/natural stream flow)\*100. See Appendix for detailed instructions.

[Water Availability Basin]: CHAMPOEG CR > WILLAMETTE R – AT MOUTH

Watershed ID	Exceed-ance Level	Month	Natural Stream Flow	Consump-tive Use	Expected Stream Flow	Reserved Stream Flows	Instream Require-ment	Net Water Available	Percent of Flow
Champoeg Cr	80	JAN	37.3	6.59	0	0	0	30.7	18%
Champoeg Cr	80	FEB	51.7	6.11	0	0	0	45.6	12%
Champoeg Cr	80	MAR	22.4	3.06	0	0	0	19.3	14%
Champoeg Cr	80	APR	10.9	1.88	0	0	0	9.02	17%
Champoeg Cr	80	MAY	6.15	3.87	0	0	0	2.28	63%
Champoeg Cr	80	JUN	3.04	6.45	0	0	0	-3.41	212%
Champoeg Cr	80	JUL	2.94	10.6	0	0	0	-7.65	361%
Champoeg Cr	80	AUG	1.88	8.41	0	0	0	-6.53	447%
Champoeg Cr	80	SEP	1.08	4.11	0	0	0	-3.03	381%
Champoeg Cr	80	OCT	1	0.3	0	0	0	0.7	30%
Champoeg Cr	80	NOV	10.1	3.74	0	0	0	6.36	37%
Champoeg Cr	80	DEC	47.8	9.46	0	0	0	38.3	20%
Champoeg Cr	80	ANN	28100	3910	0	0	0	25100	14%

Monthly flow in Cubic Feet per Second (CFS). Annual flow in Acre Feet (AF). Highlight months that exceed 20% of percent of flow.

**6. Flow Modification Compliance with State and Federal Water Quality Standards**

Based on responses to questions 3, 4, and 5, is the use in compliance with state and federal water quality standards or can compliance with state and federal water quality standards be assured, and ST&E habitat loss prevented by limiting the amount diverted, period of use, or by imposing permit condition(s)?

No  Yes

- If yes:

Recommended Conditions: [If water quality can be protected by modifying or limiting the amount diverted, period of use, or other permit conditions, then select appropriate condition from the conditions list.]

- If no, can **flow mitigation** ensure compliance with state and federal water quality standards and prevent loss of ST&E habitat?  No  Yes

**7. Compliance with other State and Federal Water Quality Standards**

ORS 468B.025 prohibits pollution of waters of the state. Are there additional water quality impairments that would result from this proposed used by degrading surface water or groundwater quality?

No  Yes

If water quality can be protected by applying permit conditions, then select all appropriate conditions from the standardized menu of conditions.

Recommended conditions: [List conditions] **Water Quality, Agricultural Water Quality Management Area Rules**

## PRE-PROPOSED FINAL ORDER ACTIONS

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DEQ requests that the applicant provide suitable replacement water as mitigation for anticipated impacts to water quality and more specifically the habitat of sensitive, threatened, and endangered fish species. Additional mitigation may be required from other Interagency Review Team members (for example: OWRD may require mitigation for periods when water is not available). Surface water flow mitigation is unlikely to provide the same benefit that groundwater can provide to gaining stream reaches. However, if groundwater mitigation is unavailable within the same aquifer, surface water mitigation may provide suitable mitigation.

### **Flow Mitigation Obligation:**

Prior to issuance of a Proposed Final Order, the applicant shall submit a mitigation proposal that is of no less volume and rate than the permitted use. The proposal shall include water that is sourced upstream of the point of diversion or appropriation, or the uppermost point on the stream at which the potential for surface water interference occurs. If a surface water right is used for mitigation, it shall be instream for the *month - month time period* and of similar water quality. The applicant should contact their OWRD caseworker to discuss flow mitigation options.

**Riparian:** If the riparian area is disturbed in the process of developing, modifying or repairing a point of diversion under this water use permit, the permittee shall be responsible for restoration and enhancement of such riparian area in accordance with the Oregon Department of Fish and Wildlife's Habitat Mitigation Policy described in Oregon Administrative Rule OAR Chapter 635-415. Prior to development, modification or repairs at the point of diversion, the permittee shall submit, to the Oregon Water Resources Department, either a Riparian Mitigation Plan approved in writing by Oregon Department of Fish and Wildlife (ODFW) or a written declaration from ODFW that riparian mitigation is not necessary. The permittee shall maintain the riparian area for the life of the permit and subsequent certificate per the approved Riparian Mitigation Plan. The permittee is hereby directed to contact the local Oregon Department of Fish and Wildlife Fish Biologist prior to development of the point of diversion.

**Water Storage Construction:** The applicant shall locate the reservoir outside of the stream's natural channel. *identify waterbody and set back to prevent stream capture and justification for distance selected.*

(Note to reviewer: The 1200C permit requires a 50-foot setback, which is cited from the National General Construction Permit OAR-660-023-0090(5). Requiring the storage reservoir to be outside of the mapped 100 year floodway may also be a protective buffer. )

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## STANDARIZED MENU OF CONDITIONS

**Water Quality:** All water use under this permit shall comply with state and federal water quality laws. The permittee shall not violate any state and federal water quality standards, shall not cause pollution of any waters of the state, and shall not place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means. The use may be restricted if the quality of source stream or downstream waters decrease to the point that those waters no longer meet existing state or federal water quality standards.

**Agricultural Water Quality Management Area Rules:** The permittee shall comply with basin-specific Agricultural Water Quality Management Area Rules described in Oregon Administrative Rule Chapter 603-095. The permittee shall protect riparian areas, including through irrigation practices and the management of any livestock, allowing site capable vegetation to establish and grow along streams, while providing the following functions: shade (on perennial and some intermittent streams), bank stability, and infiltration or filtration of overland runoff.



**Flow Restrictor:** The permittee shall install a flow control valve on the diversion system to limit use to the permitted rate. The valve shall be in place, functional, and verified by the Certified Water Rights Examiner before a certificate is issued. The valve or a suitable replacement shall remain in place for the life of the water right.

**Limit Rate:** Water withdrawal shall be limited to *Enter CFS or AF for the defined period, or a month by month rate or volume.*

**Limit Period of Use:** Water use shall be limited to the period: *start date through end date.*  
(Note to reviewer: Do not split the irrigation season. Require mitigation if water is not available during the requested time period.)

**Limit Diversion:** The permittee shall not divert water under this water use permit unless streamflow in the *waterbody name* is at or above *CFS* cubic foot per second, as determined at Gaging Station ID \_\_\_\_\_.

**Off-Channel Stored Water Releases:** The permittee shall not release polluted water from this off-channel reservoir into waters of the state except when the release is directed by the State Engineer to prevent dam failure.

**On-Channel Reservoir:** The permittee shall design and operate the water storage facility such that all waters within and below the reservoir meet water quality criteria. The permittee shall develop a reservoir operations plan that details how water quality criteria and standards will be met. A Certified Water Rights Examiner shall verify that the reservoir operations are consistent with the plan before a certificate is issued. The reservoir operator shall maintain a copy of the plan and make it available for review upon request.

**Restrict Reservoir Release:** To prevent pollution downstream, the permittee shall not release water from the reservoir when the flow at Gaging Station ID \_\_\_\_\_ (*gage name*) is below the Mean Daily Discharge of *CFS* (discharge which was equaled or exceeded for 90% percent of the time) except when the release is directed by the State Engineer to prevent dam failure.

**Live Flow:** Once the allocated volume has been stored, permittee shall pass all live flow downstream at a rate equal to inflow, using methods that protect instream water quality.

**Lining:** The permittee shall line the reservoir with *include material or allowable infiltration rate* to minimize seepage and protect groundwater quality per Oregon Administrative Rule 340-040. The liner is to be in place, inspected, and approved by the Certified Water Rights examiner prior to storage of water.\* If the liner fails, the water user shall replace it within one calendar year.

**Site-Specific Condition:** The permittee shall

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\* OAR 690-410-0010(2)(a), OAR 690-310-0120, OAR 690-310-0140

## Appendix: General Overview, Instructions for Water Availability Analysis, and Process Flow Chart

### General Overview

The purpose of OAR Chapter 690, Division 33 is to aid the Oregon Water Resources Department (OWRD) in determining whether a proposed use will impair or be detrimental to the public interest with regard to listed sensitive, threatened, or endangered (ST&E) fish species. Oregon's stream temperature, dissolved oxygen (DO), pH and several other water quality standards are based on the life cycle needs of salmonids and other resident fish and aquatic life. Exceeding the standards can disrupt the life cycle of a ST&E fish species and may cause death. In addition, OWRD must consider water quality impacts as part of a public interest review, OAR 690-310-0120. Water quality impacts and conditions unrelated to ST&E species should be noted as "Division 310" in the recommendations to OWRD. The DEQ's Water Right Application Review Procedures document contains a full description of the review process.

The two main categories of Division 33 reviews are based on the geographic distribution of ST&E fish species:

- **For Proposed Uses in the Columbia River Basin**, reviews must determine whether a proposed use complies with existing state and federal water quality standards. Upper Columbia applications specifically require applicants to provide evidence that the proposed use complies with existing state and federal water quality standards. Geographic scope: Columbia River Basin (includes all waters that ultimately drain into the Columbia River).
- **For Proposed Uses Statewide**, review is conducted under the "Statewide review" procedure. Statewide reviews must determine whether a proposed use may affect ST&E fish species habitat. The statewide review procedure is intended to identify permit conditions that can prevent the "loss" or "net loss" of essential habitat of ST&E fish species. When permit conditions cannot be identified that meet this standard, then the DEQ recommends denial of the permit. Geographic scope: all areas outside the Columbia River Basin where OWRD determines ST&E fish species are present.

### Instructions for Populating the Water Availability Summary Table using data from OWRD's WAB (Section 5)

- Open OWRD's Water Availability Reporting System.
- Search for the water availability basin of interest. Select 50% exceedance. The 50% exceedance stream flow is the stream flow that occurs at least half of the time.
- The water availability analysis will display a nested list of watersheds that contain the POD. Select the highest nesting order WAB that contains the POD.
- Download to an Excel spreadsheet. Percent of flow is calculated using this equation:

$$\text{Percent of Flow} = \frac{\text{Consumptive Use}}{\text{Natural Stream Flow}} * 100$$

You may choose to add the proposed rate (or storage amount) to the consumptive use.

### Instructions for Water Availability Analysis

To complete Section 6, review and consider the cumulative impact of consumptive withdrawals using the **OWRD WAB**. All water withdrawals and the following factors should be considered when conducting a water availability analysis.

- **Instream Flow**: Consider the percent of natural flow left instream in each month (see right-most column in Table 1). Based on best professional judgment, evaluate if the cumulative withdrawal is likely to cause

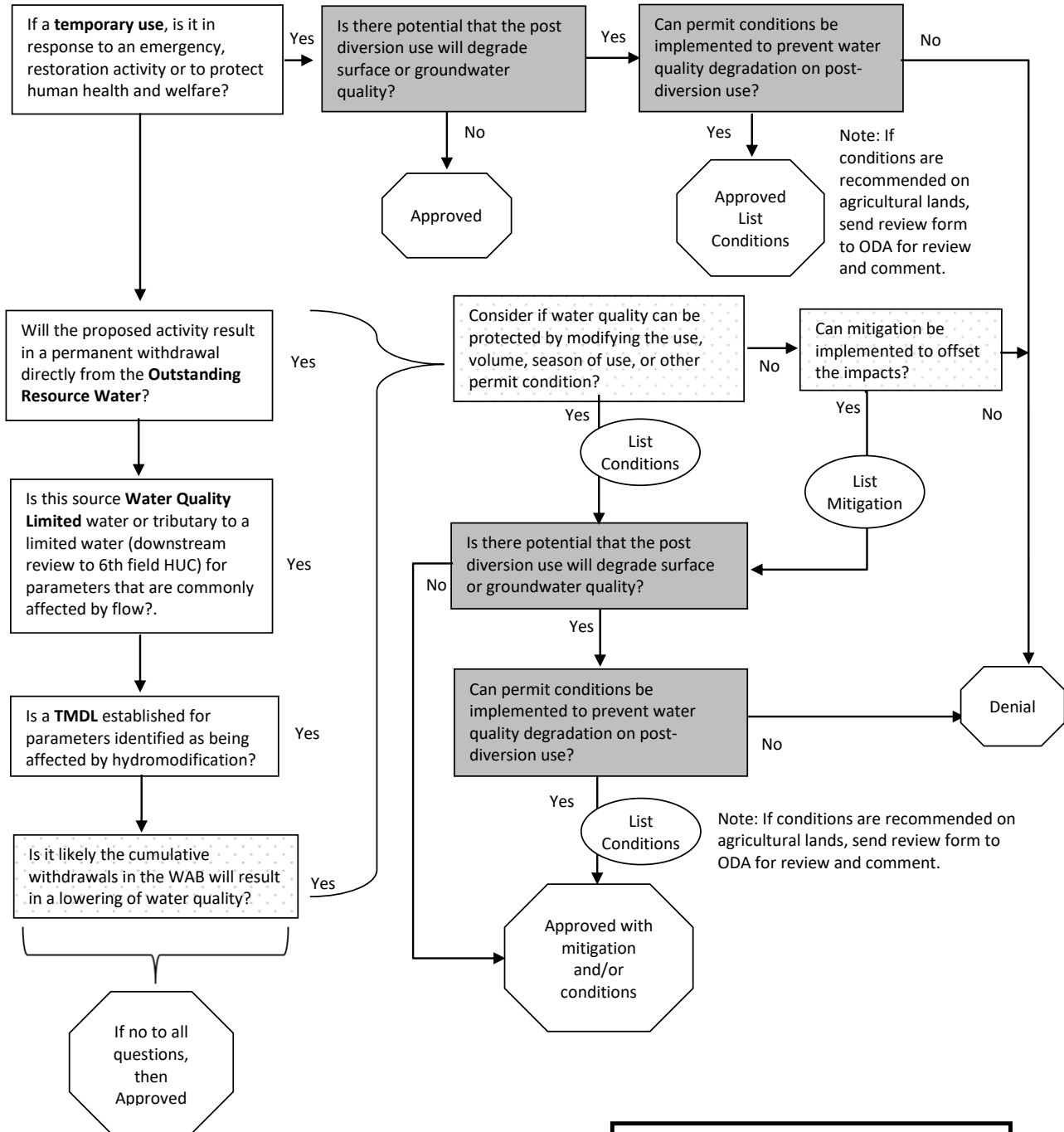
impairment to aquatic life or water quality. Water quality standards are established to protect aquatic life. In scientific literature, researchers have identified ecological harm occurring when flows are reduced by [>6-35% of daily flow](#)<sup>1</sup>. Consider the seasonality of any listings and season of withdrawal to determine impact for each month of the year.

- **Antidegradation:** Rule 340-041-0004 applies: withdrawals cannot cumulatively increase a waterbody's temperature by more than 0.5 degrees Fahrenheit or cause a 0.1 mg/l decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach so long as it has no adverse effects on threatened and endangered species. See OAR [340-041-0004\(3\)-\(5\)](#) for a description in rule of activities that do not result in lowering of water quality.
- **Flow modification:** Consider if cumulative withdrawals are contributing to flow modification and a likely limiting factor in the waterbody at certain times of the year. Temperature and dissolved oxygen are flow-related parameters. When streamflow is reduced, assimilative capacity is reduced. As a waterbody heats up, dissolved oxygen concentrations decline. Reduced stream flows (including groundwater inputs to streamflow), exacerbate temperature and/or dissolved oxygen impairments.
- **Temperature:** Increases in temperature or a reduction in dissolved oxygen adversely impacts ST&E fish. Fish require different temperature and concentrations of dissolved oxygen based on species and life history stage. Oregon's temperature and dissolved oxygen limits are based on the most sensitive species and the life history stage of those species at the location and season of concern. Additional heat or reduction in dissolved oxygen concentrations will further impact these species habitat. Reduced flows can also increase the concentrations of phosphorous, bacteria, pesticides and metals.

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<sup>1</sup> Richter BD, Davis MM, Apse C, Konrad C. 2011. *Short Communication, A Presumptive Standard For Environmental Flow Protection*. River Research and Applications. Published online in Wiley Online Library ([wileyonlinelibrary.com](http://wileyonlinelibrary.com)), DOI: 10.002/rra.1551

### DEQ Water Right Review Flow Chart



Each yes will need to be explained by how the use does not comply with existing state and federal water quality standards and how the use may affect sensitive, threatened or endangered fish species habitat.

Note: Review based on DEQ's anti-degradation rule (340-041-0004).

	Best Professional Judgment and Data
	Data
	Best Professional Judgment